

CERTIFICATE IN COMPUTATIONAL ECONOMICS

Program Learning Outcomes for the Certificate in Computational Economics

Upon completing the certificate in Computational Economics, students will be able to:

1. Demonstrate mastery of the mathematical foundations essential for formulating and analyzing economic models.
2. Achieve proficiency in Python programming and numerical methods for analyzing, visualizing, and simulating economic data and models.
3. Apply computational techniques and dynamic modeling tools to study intertemporal decision-making and policy analysis in economics.
4. Demonstrate the ability to collect, process, and interpret complex datasets, employing advanced analytical and econometric techniques to generate evidence-based economic insights

Requirements for the Certificate in Computational Economics

The certificate in Computational Economics is a graduate certificate. For general university requirements, please see [Certificates: Graduate-Level](https://ga.rice.edu/graduate-students/academic-opportunities/certificates/) (<https://ga.rice.edu/graduate-students/academic-opportunities/certificates/>). For additional requirements, regulations, and procedures for all graduate programs, please see [All Graduate Students](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/) (<https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/>). Students pursuing the certificate in Computational Economics must complete:

- A minimum of 4 courses (16 credit hours) of graduate-level study (graduate semester credit hours, coursework at the 500-level or above) to satisfy certificate requirements.
- All course requirements met with Rice University coursework (transfer credit not permitted). For additional program guidelines regarding transfer credit, see the *Policies* tab.
- A minimum overall GPA of 2.67 or higher in all Rice coursework.
- A minimum program GPA of 2.67 or higher in all Rice coursework that satisfies requirements for the graduate certificate with a minimum grade of B- (2.67 grade points) in each course.

The courses listed below satisfy the requirements for this certificate. In certain instances, courses not on this official list may be substituted upon approval of the certificate's academic advisor or, where applicable, the Program Director. Course substitutions must be formally applied and entered into Degree Works by the certificate's [Official Certifier](https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/) (<https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/>). Additionally, these course substitutions must be approved by the Office of Graduate and Postdoctoral Studies. Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

Code	Title	Credit Hours
Total Credit Hours Required for the Certificate in Computational Economics		16

Certificate Requirements

Code	Title	Credit Hours
Core Requirements ¹		
ECON 631	MATHEMATICAL FOUNDATIONS FOR COMPUTATIONAL ECONOMICS	4
ECON 632	DATA TOOLS FOR COMPUTATIONAL ECONOMICS	4
ECON 633	DYNAMIC MODELS FOR COMPUTATIONAL ECONOMICS	4
ECON 634	MACHINE LEARNING AND ALGORITHMS FOR COMPUTATIONAL ECONOMICS	4
Total Credit Hours		16

Footnotes and Additional Information

- ¹ Certain restrictions apply for international students:
- Online students pursuing the certificate in Computational Economics who are international students living outside of the U.S. may not take on-campus and in-person courses.
 - On-campus students pursuing the certificate in Computational Economics who are international students must be sure to meet the full-time semester 9 credit hour minimum for on-campus instruction to meet visa requirements.

Proposed Plan-of-Study

The following plan-of-study represents the suggested two-semester sequence in which students complete the required coursework for the certificate in Computational Economics. Substitution of courses may be made on a rare, exceptional basis with the permission of the program director.

Course	Title	Credit Hours
First Year		
1st Semester (Fall)		
ECON 631	MATHEMATICAL FOUNDATIONS FOR COMPUTATIONAL ECONOMICS	4
ECON 632	DATA TOOLS FOR COMPUTATIONAL ECONOMICS	4
Credit Hours		8
2nd Semester (Spring)		
ECON 633	DYNAMIC MODELS FOR COMPUTATIONAL ECONOMICS	4
ECON 634	MACHINE LEARNING AND ALGORITHMS FOR COMPUTATIONAL ECONOMICS	4
Credit Hours		8
Total Credit Hours		16

Policies for the Certificate in Computational Economics

Program Restrictions and Exclusions

Students pursuing or seeking admission into the Certificate in Computational Economics (COE) program, regardless of which program option (whether on-campus or online) should be aware of the following program restrictions:

- Students must apply to either the on-campus or online COE program and are admitted into one program cohort or the other.
- Current international Rice students pursuing a professional (or terminal) master's degree program **on-campus** and the **online** Certificate in Computational Economics (COE) program must meet Residency requirements during their master's degree program.
- Current international Rice students pursuing a professional (or terminal) master's degree program **online** *may not* pursue one of the **on-campus** Certificate in Computational Economics (COE) program due to Residency requirements.
- Current international Rice students pursuing a PhD degree program and the **online** Certificate in Computational Economics (COE) program must meet Residency requirements during their PhD degree program.
- Current Rice students pursuing a PhD degree program must apply for and be accepted into the Certificate in Computational Economics (COE) program (whether on-campus or online) *before* enrolling in more than one course from the curriculum that satisfies certificate requirements.

Admission

The Certificate in Computational Economics (COE) exists as two distinct offerings, with both an on-campus and online option. Students must apply to either the on-campus or online program and are admitted into one program cohort or the other. The admission standards are the same for both programs. Admission to the Certificate in Computational Economics (COE) is open to current degree-seeking Rice graduate social science students. No formal application is required. Students must declare the certificate using the *Declaration and Change of University Certificate Form (GR)* available in [ESTHER \(https://esther.rice.edu\)](https://esther.rice.edu). Declaration of the certificate requires the student to obtain the approval of their director of graduate studies (in the degree program to which they have been admitted) as well as approval from the appropriate certificate advisor for the university certificate program.

Admission to the Certificate in Computational Economics (COE) is also open to non-degree-seeking students. Applicants must hold a bachelor's degree (BS or BA) from an accredited institution. The Certificate in Computational Economics (COE) governing committee will review each applicant's academic record and credentials individually and will make all admission decisions.

Applications for the Certificate in Computational Economics (COE) program are due by **April 30** for fall admission. When completing the online application, candidates will be asked to submit the following items electronically to the Graduate Admissions Committee by the program's deadline:

- Transcripts from all undergraduate and graduate schools attended.
- All student applicants must upload an unofficial transcript to the application and also send an official copy of their transcripts.
- A Statement of Purpose is required for all applicants. This statement should clearly and succinctly summarize the applicant's past academic and professional experience and achievements, discuss their motivation for seeking the Graduate Certificate in Computational Economics, and explain or articulate their future goals. The applicant should also briefly discuss any other factors they might want the Admission Committee to consider while reviewing their application (e.g., personal background, work experience, etc.).
- Graduate Record Examination (GRE) scores are optional for all applicants. If an applicant has relevant industrial experience, the Admissions Committee will factor in work experience instead of any GRE scores when evaluating the application. If taking the GRE, applicants should have their scores sent directly to Rice University using code: 6609 (GRE subject tests are not required).
- TOEFL/IELTS scores are required for all international students who have not conferred a degree from an English-speaking University. The code to send the electronic scores is: 6609.
 - TOEFL score, the minimum is 90 on the iBT and 600 on the paper-based TOEFL.
 - IELTS score, the minimum is 7.
 - This requirement is automatically waived for eligible applicants who upload their transcript from an English-speaking University into this application, showing a degree in-progress or conferred.
- CV/Resume - applicants should upload their most current Curriculum Vitae or Resume.
- The application fee of \$100. The fee can be paid either by credit card or electronic check. The Department of Economics does not consider application fee waivers. Payment of the application fee cannot be deferred until the time of enrollment. The application will be processed only when the application fee has been received.

In some instances, upon completion of the Certificate in Computational Economics (COE), a standalone graduate certificate recipient may wish to apply for the Master of Computational Economics (MCEcon) degree. For more information, please see the *Opportunities* tab.

Financial Aid

No financial aid is available from Rice University for students in the Certificate in Computational Economics (COE) program.

Transfer Credit

For Rice University's policy regarding transfer credit, see [Transfer Credit \(https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer\)](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer). Some departments and programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the appropriate academic department offering the Rice equivalent course (corresponding to the subject code of the course content) and by the Office of Graduate and Postdoctoral Studies (GPS). Students are encouraged to meet with their academic program's advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines

Students pursuing the certificate in Computational Economics should be aware of the following departmental transfer credit guideline:

- Transfer credit coursework cannot be applied or used to meet any of the program's course requirements.

Additional Information

For additional information, please see the Economics website: <https://economics.rice.edu/>.

Opportunities for the Certificate in Computational Economics

Stackable Certificate Option for Rice Graduate Certificate Students

In certain situations and with some graduate degree-granting programs, Rice graduate certificate students may use the credits earned toward that standalone graduate certificate credential toward a specific Rice graduate degree, unless specifically prohibited by the General Announcements.

To do so, Rice graduate certificate students in good standing may apply to a Rice graduate degree-granting program. If they do so within three (3) years of completing the Rice graduate certificate, upon acceptance and with certain approvals, they may petition to apply eligible coursework from the Rice graduate certificate to the Rice graduate degree-granting program. For credits earned toward the certificate to count toward the graduate degree, students must complete the graduate degree within the time-to-degree boundaries defined in the General Announcements, based on the start term of the graduate certificate. In this way, the standalone graduate certificate is *stackable* toward a Rice graduate degree.

In this option, graduate certificate students completing the *standalone* Certificate in Computational Economics may apply for admission into the Master of Computational Economics (MCEcon) degree program. This standalone graduate certificate is *stackable* toward the MCEcon degree.

Additional Information

For additional information, please see the Economics website: <https://economics.rice.edu/>.